

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

La Belle Lakes #1 and #2

Water Body Segment at a Glance:

County: Lewis
Nearby Cities: La Belle
Area Impaired, Lake #1: 17 acres
Pollutant: Atrazine
Area Impaired, Lake #2: 112 acres
Pollutants: Atrazine, Cyanazine
Source: Corn, sorghum production



State map showing location of watershed

Note: Long term average Atrazine levels in La Belle Lake #1 now meet state water quality standards, therefore, this lake was deleted from the 2002 303(d) List. La Belle Lake #2 was deleted from the 2004-06 303(d) List for Atrazine as data indicate attainment with criteria. Also deleted for Cyanazine, as data indicate designated beneficial use is supported.

TMDL Priority Ranking: La Belle Lake #1 deleted Dec. 17, 2003
La Belle Lake #2 deleted Sept. 17, 2007

Description of the Problem

Beneficial uses of La Belle Lakes #1 and #2

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Human Health Protection (Fish Consumption)
- Boating and Canoeing
- Drinking Water Supply

Use that is impaired

- Drinking Water Supply

Standards that apply:

- Missouri's Water Quality Standards 10 CSR 20-7.031, Table A, allows a maximum of three micrograms per liter ($\mu\text{g/L}$) atrazine. Because this number is based on health risk associated with a 70 year exposure period, the three $\mu\text{g/L}$ is interpreted as a long term average.
- A federal health advisory level of one microgram per liter ($\mu\text{g/L}$) cyanazine is recommended for drinking water supplies.

Background Information and Water Quality Data

The two La Belle Reservoirs total 129 acres in size and previously served as the public water supply source for about 850 people in La Belle, and also supplied water to Knox County Public Water Supply District No.1. The City of La Belle and Knox County PWSD No.1 now obtain all their drinking water from the Clarence Cannon Wholesale Water Commission and no longer use La Belle Reservoirs for their water supply.

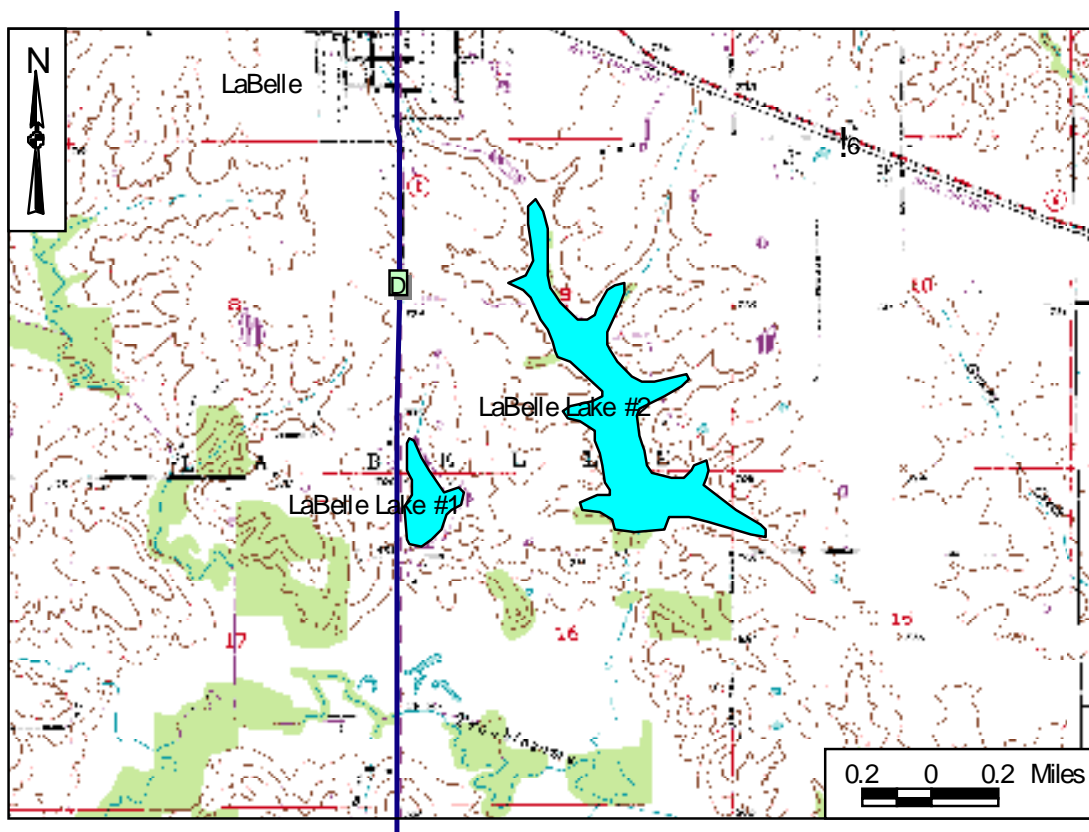
Runoff from corn and sorghum production areas in the watershed has resulted in measurable amounts of atrazine being detected within these lakes. Atrazine is a widely used herbicide for control of broadleaf weeds. It is the most heavily used herbicide on corn and grain sorghum in Missouri. Since 1993, its use has been greatly restricted. Atrazine is considered a possible human carcinogen, so the state standard for allowable amounts in drinking water supply source waters is set at 3 µg/L or parts per billion. The long term atrazine average in Lake #1 fell to only 0.77 µg/L and this lake was deleted from the 2002 303(d) List. Now, Lake #2 has a long term average atrazine level of 1.18 µg/L and was dropped from the 2004-06 303(d) List

Cyanazine is an agricultural herbicide that was used from 1971 to 1999, when its manufacturer voluntarily withdrew it from production. At one time it was the fourth most widely used synthetic chemical pesticide in U.S. agriculture, applied to corn, cotton, and sorghum crops to control broadleaf weeds. It is relatively persistent in the environment, and under certain conditions will remain at significant levels in surface water for over one year. It has been identified as a surface water contaminant in 30 states, including Missouri. Cyanazine was withdrawn from use after being linked to a range of adverse health effects, including respiratory distress, cerebral palsy and impaired fetal development. After it was withdrawn from production, it virtually disappeared from all Missouri waters. **This is because triazines metabolize to something else, typically in less than one year.**

Missouri decided not to include La Belle Lake No.2 in the 2004-06 List citing the lack of a water quality criterion. The state's original listing was based on the federal health advisory level of 0.001 mg/L for the protection of drinking water, since Missouri has no criterion for cyanazine. Following the national cancellation of the pesticide's registration, which became effective Dec. 31, 1999, cyanazine levels in La Belle Lake No.2 have fallen below the health advisory level. As such, EPA approves the state's decision to not list La Belle Lake No.2.

The Department has terminated monitoring of raw water from these two lakes since they no longer serve as drinking water supply sources.

Map of La Belle Lakes #1 and #2



The charts summarize the existing data for Lakes No. 1 and 2.

Atrazine Concentrations in La Belle Lake #1 ($\mu\text{g/L}$)

August, 1999	0.71
December, 1999	0.51
March, 2000	0
June, 2000	0
September, 2000	0

Source: Missouri Department of Natural Resources

Monthly Atrazine Concentrations in La Belle Lake #2
(µg/L)

Year	Month	Average Atrazine		Year	Month	Average Atrazine
1999	1	1.4		2001	1	1
1999	2	1		2001	2	0.7
1999	3	1		2001	3	0.76
1999	4	1		2001	4	0.5
1999	5	1		2001	5	1.88
1999	6	1.1		2001	6	2.87
1999	7	1.2		2001	7	1.9
1999	8	0.81		2001	8	1.65
1999	9	1.2		2001	9	1.86
1999	10	0.6		2001	10	1.7
1999	11	0.8		2001	11	1.53
1999	12	0.66		2001	12	2.02
2000	3	0		2002	3	1.75
2000	6	0		2002	6	0.92
2000	9	0.57		2002	9	2.83
2000	12	0.52		Average Atrazine:		1.18

Sources: Missouri Department of Natural Resources and Novartis Inc. (now Syngenta)

For more information call or write:

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